A taxonomic revision of *Erythrina* L. (Fabaceae: *Faboideae*) in Australia

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Summary

Bean, A.R. (2008). A taxonomic revision of *Erythrina* L. (Fabaceae: *Faboideae*) in Australia. *Austrobaileya* 7(4): 641–658. *Erythrina* L. is represented in Australia by the following native or naturalised taxa; **E. caffra* Thunb., **E. crista-galli* L., *E. fusca* Lour., *E. insularis* F.M.Bailey, *E. numerosa* A.R.Bean, **E. speciosa* Andrews, **E.* × *sykesii*, *E. variegata* L., *E. vespertilio* subsp. *biloba* (F.Muell.) A.R.Bean and *E. vespertilio* Benth. subsp. *vespertilio*. *Erythrina fusca* is newly recorded for Australia. Distribution maps and illustrations are provided for all taxa. A dichotomous identification key catering for both flowering and fruiting material is included.

Key Words: *Erythrina,* Fabaceae, Australia, taxonomy, identification key, new species

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Introduction

Erythrina L. is a genus comprising around 120 species, occurring throughout the tropics and subtropics of the world, but with two-thirds of the species in the Americas (Krukoff & Barneby 1974).

The last comprehensive account of *Erythrina* in Australia (Bentham 1864) recorded just two species. Krukoff & Barneby (1974), in their conspectus of the genus, also recorded just two indigenous *Erythrina* species (*E. vespertilio* and *E. insularis*). Krukoff (1982) again recorded two indigenous species for Australia. He maintained *E. vespertilio*, added *E. variegata*, but excluded *E. insularis*, which he then regarded as a synonym of *E. vespertilio*. The present account includes five native and four naturalised taxa. This increase is a reflection of field-based knowledge of the native taxa and the recent naturalisation of some long-cultivated taxa.

Erythrina species are frequently cultivated as ornamental plants because of their showy (usually red) flowers. In developing countries, they are also used for shade or as a convenient trellis for vines such as pepper, betle leaves, vanilla, and yam (Whistler & Elevitch 2006). Some *Erythrina* are used as a "living fence", particularly cultivars chosen for their upright slender growth habit. Stem cuttings, up to a metre high and 10 cm diameter, will sprout roots in moist ground, and when planted close together, quickly develop into a prickly impenetrable fence. The ease by which some *Erythrina* taxa propagate themselves by cuttings or even by fallen branches is a factor in the spread of some alien taxa in Australia, particularly *E.* × *sykesii*.

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Materials and methods

The data and descriptions presented here are based largely on a morphological study of herbarium specimens at BRI (including spirit material), NSW and MEL, and images of type specimens at K. Most taxa have been examined in the field by the author. Leaf shapes follow Hickey & King (2000). Measurements of floral parts are based on fresh material, or material preserved in 70% alcohol, or reconstituted. Measurements of leaves, pods and seeds are based on dried herbarium material. All measurements are based on material collected from Australia, except for *Erythrina fusca*, where additional measurements were obtained from New Guinea specimens. Curved structures (e.g. standard petal, pod) were measured along the curvature, and not directly from end to end. Pod length includes the stipe.

Good quality herbarium specimens of *Erythrina* are difficult to collect and preserve. For example, it is rarely possible to collect flowers and mature fruits at the same time, and many species are leafless when in flower. Furthermore, pressed specimens are very prone to "falling apart" during the drying process. The leaves and flowers readily abscise from the branchlets, so that one is often left with a pile of separate leaflets, flowers, twigs etc. With these difficulties in mind, I have attempted to create an identification key that will cater for imperfect herbarium specimens, which, it must be said, form the greater part. *Erythrina speciosa* is included in the key to species but not treated in the main text. A description of it may be found in Green (1994).

The following abbreviations are used throughout the paper: L.A. = Logging Area, N.P. = National Park; N.S.W. = New South Wales, N.T. = Northern Territory, Qld = Queensland, S.F. = State Forest, T.R. = Timber Reserve, W.A. = Western Australia.

Taxonomy

Erythrina L., *Sp. Pl.* 2: 706 (1753), *Gen. Pl.* ed. 5, 316 (1754). **Type:** *E. corallodendron* L., [lecto: *fide* Britton (1924: 427)].

***Etymology*:** from the Greek *erythros* meaning red, in reference to the bright red flowers possessed by most species in the genus.

Trees, shrubs, or rarely herbaceous resprouters. Large conical prickles usually present on trunk and branches, occasionally on the petioles. Leaves spirally arranged, pinnately trifoliolate, in most species deciduous; stipules present but often caducous, stipels fleshy and glandular. Leaflets pinnately-veined though often 3-veined at the base, intramarginal veins absent. Inflorescences terminal or axillary, widely spreading from distal parts of branchlets, pseudoracemose, indeterminate, oldest flowers at the base, flowers borne in fascicles, bracts and bracteoles deciduous. Calyx with a tubular or obconical hypanthium, often split down one side at anthesis; calyx lobes or teeth 1–5, usually obscure and sometimes lacking. Corolla showy, the keel and wing petals usually much smaller than the standard. Stamens 10, with 9 filaments connate above the middle, alternately longer and shorter, the upper filament free or basally connate with the staminal tube; anthers bithecate with longitudinal dehiscence, dorsifixed. Style terminal, incurved, not bearded. Fruits dehiscent, linear or linear-oblong, often sickle-shaped, more or less moniliform. Seeds estrophiolate, ovoid, ellipsoid or sub-globose, with a very hard testa.

Chromosome number: $2n = 42$ (Hennessy 1991)

Key to native and naturalised taxa of *Erythrina* in Australia

1 Leaflets elliptical (broadest near the middle), 1.5–2.3 times longer than wide 2

1. Leaflets not elliptical (deltoid, obdeltoid, rhomboid, or variously lobed), length 0.19–1.5 times that of width 3

2 Leaflets with minute waxy reticulations below[1]; one or two prickles usually present on petioles; pedicels 13–25 mm at anthesis; standard petal and keel petals pink to red; seeds black with brown streaks, 2–6 per pod . . . . . **7. *E. crista-galli**

2. Leaflets without waxy reticulations below; petioles without prickles; pedicels 5–13 mm at anthesis; standard petal and keel petals mainly yellow-orange; seeds uniformly dark brown, 6–12 per pod . . . . . **8. E. fusca**

[1] high magnification needed; not obvious on every leaflet

3 Indumentum persistent on abaxial veins of fully expanded leaves; standard petal straight, 7–11 mm wide . . . . . ***E. speciosa** Andr.[2]
3. Indumentum absent from fully expanded leaves; standard petal at least slightly curved, 12–46 mm wide 4

4 Indumentum comprising tiny stellate or dendritic hairs; keel petals free (indigenous taxa) 5
4. Indumentum comprising simple hairs; keel petals connate (naturalised taxa) 9

5 Leaflet margins not sinuate or lobed, strongly 3-veined at base with veins converging at point of petiole attachment (littoral habitats) 6
5. Leaflet margins sinuate or with lateral lobes, either not 3-veined at base or veins converging inside lamina (not in littoral areas) 7

6 Terminal branchlets with dark conical prickles; corolla orange-red at anthesis; pods indehiscent, only slightly constricted between seeds, with raised anastomosing veins; seeds brown to purplish-brown . . . . . **1. E. variegata**
6. Terminal branchlets without prickles; corolla greenish-yellow at anthesis; pods dehiscent, highly constricted between seeds, smooth or faintly striate; seeds bright red . . . . . **2. E. insularis**

7 Leaflets broadly V-shaped, central lobe absent or up to 12 mm long, lateral lobes parallel-sided, 32–66 mm long and 5–17 mm wide . . . . . **3b. E. vespertilio** subsp. **biloba**
7. Leaflets ± rhomboid or obdeltoid, central lobe well developed (8–40 mm long), lateral lobes tapering, 20–50 mm wide at their base 8

8 Pods 7–14 cm long, containing 1–4(–5) seeds; standard 32–40 mm long,anthers 2.1–2.8(–3.1) mm long; fascicles 8–15(–25) mm apart . . . . . **3a. E. vespertilio** subsp. **vespertilio**
8. Pods 13–24 cm long, containing 5–11 seeds; standard 39–54 mm long, anthers 2.8–4.3 mm long; fascicles 1.5–8 mm apart . . . . . **4. E. numerosa**

9 Standard slightly recurved; terminal leaflet 95–180 mm long; fruits never develop . . . . . **6. *E. × sykesii**
9. Standard strongly recurved; terminal leaflet 55–105 mm long; fruits consistently develop. . . . . **5. *E. caffra**

[2] this species is included in the key on the basis of reported naturalisation on Norfolk Island (Green 1994). No naturalised material has been seen by the present author.

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1. Erythrina variegata L., *Herb. Amboin.* 10 (1754). **Type:** illustration of "Gelala Alba" in Rumphius, *Herb. Amboin.* 2: 234, t. 77 (holo: the illustration), *fide* Merrill (1917: 33, 276).

Erythrina corallodendrum var. *orientalis* L., *Sp. Pl.* 706 (1753); *E. variegata* var. *orientalis* (L.) Merr., *Interpr. Herb. Amboin.* 276 (1917). **Type:** India. Malabar. "Mouricou" in Rheede, *Hort. Malab.* 6: 13, t. 7 (lecto: the illustration), *fide* Krukoff & Barneby (1974: 431).

Erythrina indica Lam., *Encycl.* 2(1): 391 (1786). **Types:** t. 7 of Rheede, *Hort. Malab.* 6: 13 (syn: *n.v.*); t. 76 'Gelala litorea' of Rumph., *Herb. Amboin.,* 2: 234 (syn: *n.v.*).

Erythrina phlebocarpa F.M.Bailey, *Queensland Agric. J.* 1: 368 (1897); *E. indica* var. *phlebocarpa* (F.M.Bailey) Domin, *Biblioth. Bot.* 89: 222 (1926). **Type:** Queensland. Cook District: Newcastle Bay, Cape York Peninsula, *s.dat., F.L.Jardine s.n.* (lecto: BRI [AQ22856], the sheet bearing the fruit), *fide* Krukoff (1972: 135).

***Illustrations*:** Cooper & Cooper (2004: 210); Verdcourt (1979: 428); Whistler & Elevitch (2006: 331, 333); Williams (1979: 110).

Tree 5–25 m high, deciduous. Bark mostly smooth, with shallow longitudinal furrows, grey to grey–brown. Trunk and branches bearing large scattered conical prickles, terminal branchlets with small black prickles. Indumentum comprising minute stellate or dendritic hairs, confined to apical section of branchlets, developing leaves, ovaries and young fruits. Leaves uniformly green or sometimes strikingly variegated green and yellow, not waxy below. Petioles unarmed, terete, 40–140 mm long; petiolule of basal leaflets 6–11 mm long; terminal leaflet broadly ovate, deltoid or rhomboid, 70–190 mm long, 80–210 mm wide, even larger on young plants, length/breadth ratio 0.70–1.05, apex acute to acuminate, base obtuse or truncate; lateral lobes absent; basal leaflets similar but conspicuously smaller. Leaflet venation penninerved, basal pair of lateral veins converging at point of petiole attachment. Inflorescences borne on leafless branches, >100-flowered, 20–40 cm long, rachis and peduncles about same length, peduncles 6–9 mm diameter; fascicles 3-flowered, often two or three fascicles at same position along rachis, each fascicle group 4–6 mm apart on rachis, pedicels 5–9 mm long at anthesis; calyx tubular in bud, 19–35 mm long, a ventral longitudinal split developing as corolla expands, extending almost to base of calyx, apex truncate or with 2–3 filiform lobes each 2–6 mm long; all petals red to scarlet, prominently veined; standard 52–68 × 16–23 mm, apex obtuse, recurved and exposing staminal column; wings and keel similar, wings 16–20 mm long; keel petals 16–20 mm long, free, obtuse; stamens 57–70 mm long, anthers 2.9–4.3 mm long, brown; ovary hairy, ovules 11–16. Pods straight, 8–25 cm long, 1.7–2.8 cm wide at widest point, scarcely narrowed between the seeds, outer surface with raised anastomosing veins, ± indehiscent and fragmenting when mature, glabrous at maturity, seeds usually not easily visible. Seeds 2–10 per pod, ellipsoidal, 13–18 mm long, uniform in colour, brown to purplish-brown, with a dark hilum. *Indian coral tree*. **Fig. 1F**.

***Additional specimens examined*: Northern Territory.** Cato River, 4 km S of mouth, on headland, Apr 1996, *Cowie 6705* (MEL); Inglis Island, Dec 1987, *Dunlop 7437* (BRI, DNA). **Queensland.** Cook District: Dauan Island, Torres Strait, Sep 1971, *Lawrie s.n.* (BRI [AQ003901]); Warraber Island, Torres Strait, Jul 1996, *Waterhouse 3903* (BRI); Murray Island, Aug 1970, *Lawrie 105* (BRI); Palfrey Island, near Lizard Island, Jul 1990, *Batianoff 12135* (BRI); Quarantine Bay, Cooktown, Aug 1977, *Scarth-Johnson 574A* (BRI); Low Isles, 12 km NE of Port Douglas, Jun 1973, *Everist 9964* (BRI); Green Island, Aug 1973, *Stoddart 4247* (BRI); Clump Point, ESE of El Arish, Sep 1974, *Moriarty 1574* (BRI, CANB); Clump Point, near Mission Beach, Jan 2002, *Cooper WWC1668 & Cooper* (BRI). North Kennedy District: Goold Island, NE Side, Aug 1970, *Everist 9696* (BRI); Cardwell Gap, 13 km NNE of Ingham, Oct 1976, *Everist s.n.* (BRI [AQ 198159]); Port Denison, *s.dat.*, *Fitzalan s.n.* (MEL); Daydream Island, Apr 1990, *Batianoff 900461* (BRI); Conway N.P., Airlie Beach, Funnel Bay, May 1994, *Batianoff 9405221* (BRI); Wilson's Beach, Conway, SE of Proserpine at head of Repulse Bay, Apr 1985, *Rodd 4439 & Hardie* (BRI, NSW); Hayman Island, Jun 1934, *White 10123* (BRI). South Kennedy District: Lindeman Island, Nov 1985, *Batianoff 3332 & Dalliston* (BRI); Cape Hillsborough, R60, Ossa, May 1975, *Hyland 8220* (BRI); Dolphin Heads, Mackay, Sep 1994, *Batianoff 940912 & Saltman* (BRI). Port Curtis District: Eurimbula N.P., 6 km NW of Agnes Water, Oct 1990, *Gibson 1360* (BRI, MEL).

***Distribution and habitat*:** *Erythrina variegata* is widely distributed in coastal areas from Africa to the eastern Pacific Ocean, including Tanzania, Madagascar, India, Burma, Vietnam, southern China, Malesia, New Caledonia and Tahiti (Krukoff 1972). It is not native to North or South America but was introduced there over 200 years ago. In Australia, it is indigenous on the north-eastern coast of N.T., in Qld from Torres Strait and along the east coast as far south as Agnes Waters (**Map 6**). It also occurs on some island territories of Australia, *viz.* Christmas Island and North Keeling Island (Du Puy & Telford 1993). It inhabits littoral rainforest or open forest behind beaches and headlands, and along the tidal sections of rivers.

***Phenology*:** Flowers from August to October; fruits are recorded for nearly every month of the year.

***Notes*:** Krukoff (1972) insisted that the leaves of the type collection of *Erythrina phlebocarpa* belong to the African species *E. lysistemon*, while the fruits are of *E. variegata*. He did not give any reasons for identifying the leaves as *E. lysistemon*, and I cannot discern any distinctive feature of the

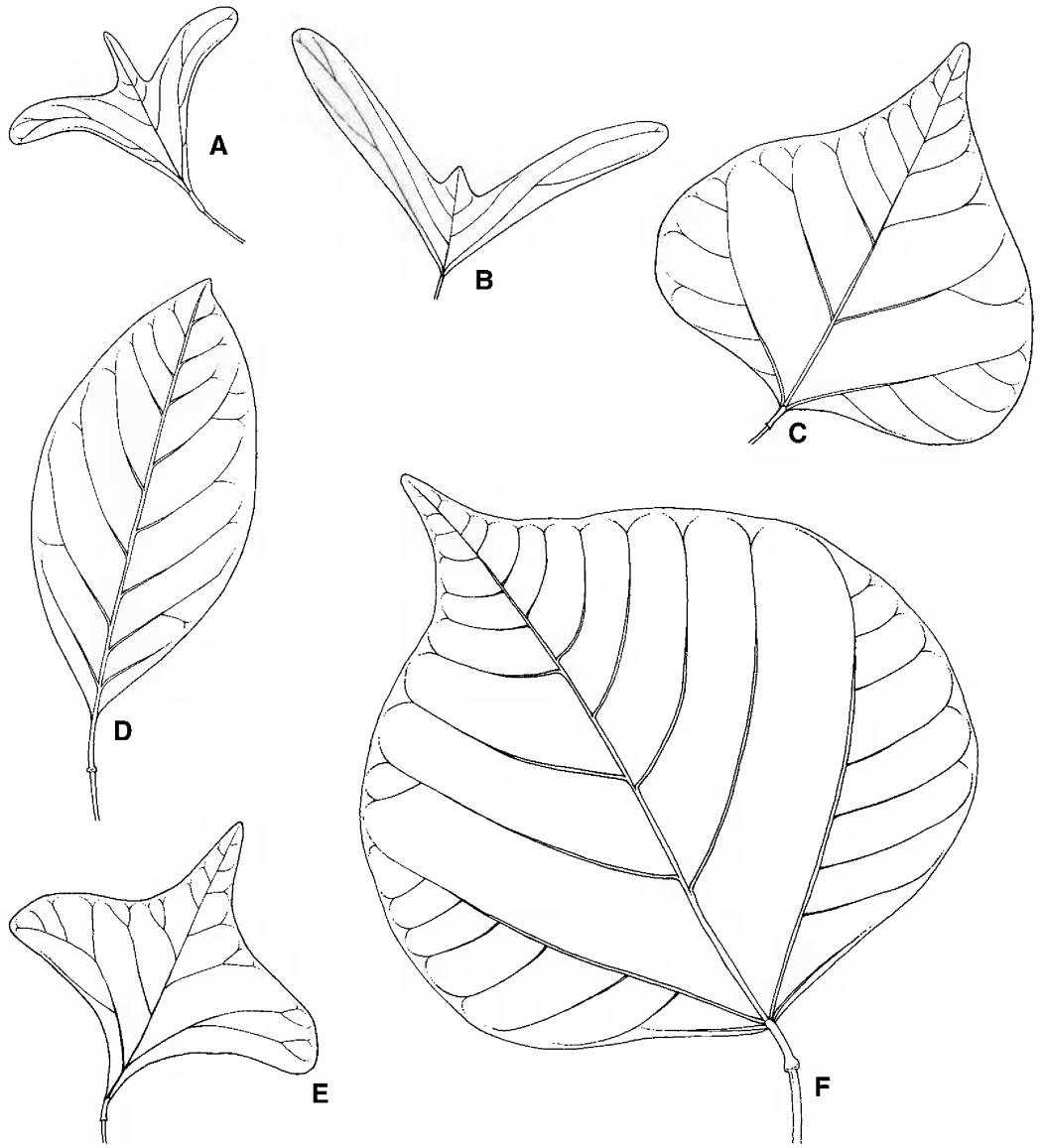

Fig. 1. Terminal leaflets of *Erythrina* spp. A. ***E. vespertilio*** subsp. ***vespertilio***. B. ***E. vespertilio*** subsp. ***biloba***. C. ***E. caffra***. D. ***E. crista-galli***. E. ***E. numerosa***. F. ***E. variegata***. A from *Bean 8492*; B from *McRae s.n.* (AQ501724); C from *Stephens GBS12*; D from *Hall & Bird s.n.* (AQ659717); E from *Grimshaw G8 et al.*; F from *Moriarty 1574*. All BRI. Del. B. Connell.

foliage of *E. lysistemon* that would support the claim. The foliage is entirely consistent with *E. variegata*, and it seems clear that all parts of the type collection are referable to that species. Krukoff's lectotypification of *E. phlebocarpa* on the fruiting sheet at BRI must however be followed.

This species is widely utilised by mankind throughout its range, as a fodder tree, a trellis plant, or as a living fence (Whistler & Elevitch 2006).

***Etymology*:** From the Latin *variegatus* meaning variegated. A variant of the species has leaves displaying variegation

(conspicuously white veins on an otherwise green leaf). Apparently this variant was the one described by Linnaeus.

2. Erythrina insularis F.M.Bailey, *Queensland Agric. J.* 1: 228 (1897). **Type:** Queensland. Cook District: Turtle Island, June 1897, *F.M. Bailey 29* (holo: BRI; iso: MEL).

***Illustration*:** Cooper & Cooper (2004: 210).

Tree 4–12 m high, deciduous. Bark mostly smooth, with pale longitudinal fissures, grey to brown. Trunk and branches with or without prickles, terminal branchlets without prickles. Indumentum comprising minute stellate or dendritic hairs, confined to apical section of branchlets, developing leaves, ovaries and young fruits. Leaves uniformly green, not waxy below. Petioles unarmed, terete, 45–135 mm long; petiolule of basal leaflets 4–10 mm long; terminal leaflet deltoid to rhomboid, 60–100 mm long, 55–120 mm wide, length/breadth ratio 0.78–1.11(–1.32), apex obtuse or acute; base obtuse to broadly cuneate; margins sometimes slightly sinuate. Leaflet venation penninerved, basal pair of lateral veins converging at point of petiole attachment (i.e. 3-veined at base). Inflorescences borne on leafless branches, 15–40-flowered, 7–19 cm long, rachis and peduncles about same length, peduncles 3.5–6.3 mm diameter; fascicles 3-flowered, often two or three fascicles at same position along rachis, each fascicle group 2–7 mm apart on rachis, pedicels 7–11 mm long at anthesis; calyx tubular in bud, 15–19 mm long, truncate, a longitudinal ventral split developing as corolla expands, extending almost to base of calyx; petals initially pale yellow, senescing to orange or scarlet, prominently veined; standard 25–41 × 12–15 mm, apex obtuse, strongly recurved and exposing staminal column, wings and keel very similar, wings 12–16 mm long; keel petals 14–15 mm long, free, obtuse; stamens 35–40 mm long, anthers 3.2–4.2 mm long, brown; ovary hairy, ovules 8–11. Pods often curved at maturity, 7–17 cm long, 1.3–1.8 cm wide at widest point, conspicuously narrowed between the seeds, glabrous, dehiscent, outer surface with faint raised parallel veins. Seeds 2–7, ellipsoidal, 9.5–12 mm long, uniform in colour, scarlet to red, with a pale or dark hilum, often remaining attached to pod and easily visible. **Fig. 2B**.

***Additional specimens examined*: Queensland.** Cook District: Gabba Island, Torres Strait, Jul 1996, *Waterhouse 3891* (BRI); Dalrymple Island, Jan 1998, *Waterhouse 4766* (BRI); Pumpkin Island, Jun 2003, *Wannan 3101 & Buosi* (BRI); Coconut Island, central Torres Strait, Sep 1971, *Lawrie s.n.* (BRI [AQ008846]); Coconut Island, Aug 1994, *Wannan 64* (BRI); western end of Warraber Island, Torres Strait, May 2003, *Hucks LAH164* (BRI, CANB); Warraber (formerly Sue) Island, Torres Strait, Jun 1995, *Waterhouse 3668* (BRI); Milman Island, Cape York, Jan 1995, *Card MC24* (BRI); On coast, near Cowal Creek and False Orford Ness, Sep 1987, *Gitay HG101* (BRI); Hannibal Island, near Shelburne Bay about 16 km W of Helby Hill, Jul 1969, *Done s.n.* (BRI [AQ007594]); Bird Island, Nov 1973, *Stoddart 5090* (BRI); Farmer Island N.P., Great Barrier Reef Marine Park, Dec 2004, *Batianoff 31229* (BRI); Farmer Island, Feb 1991, *Card FAR1* (BRI); ex Haggerstone Island, cultivated Tolga, Oct 2001, *Ford AF3028* (BRI).

***Distribution and habitat*:** *Erythrina insularis* is endemic to Qld. It is confined to the Torres Strait and north-eastern Cape York Peninsula (**Map 4**). It inhabits semi-evergreen notophyll vine forest, often as an emergent. Nearly all records are from coral islands or cays, but there is a single known occurrence from a continental island (Gabba Island), and one record from the mainland (Cowal Creek).

***Phenology*:** Flowers from July to November; fruits from December to July.

***Notes*:** Adema (1996) included *Erythrina merrilliana* Krukoff as a synonym of *E. insularis*. The former was described from Papua New Guinea (Central Province, 700 metres altitude). New Guinea specimens may be consistently distinguished by the 5–6 mm long calyx lobes and the orange to red corolla (calyx lobes lacking, corolla initially pale-yellow, senescent flowers orange for *E. insularis*). These characters, in addition to marked differences in habitat, indicate that they are distinct species.

Erythrina insularis is sympatric with *E. variegata*. For example, both species have been collected from Warraber island (*Waterhouse 3903*; *Hucks 164*). Sterile specimens of *E. insularis* and *E. variegata* are of very similar appearance, but can be distinguished by the presence (*E. variegata*) or absence (*E. insularis*) of prickles on the

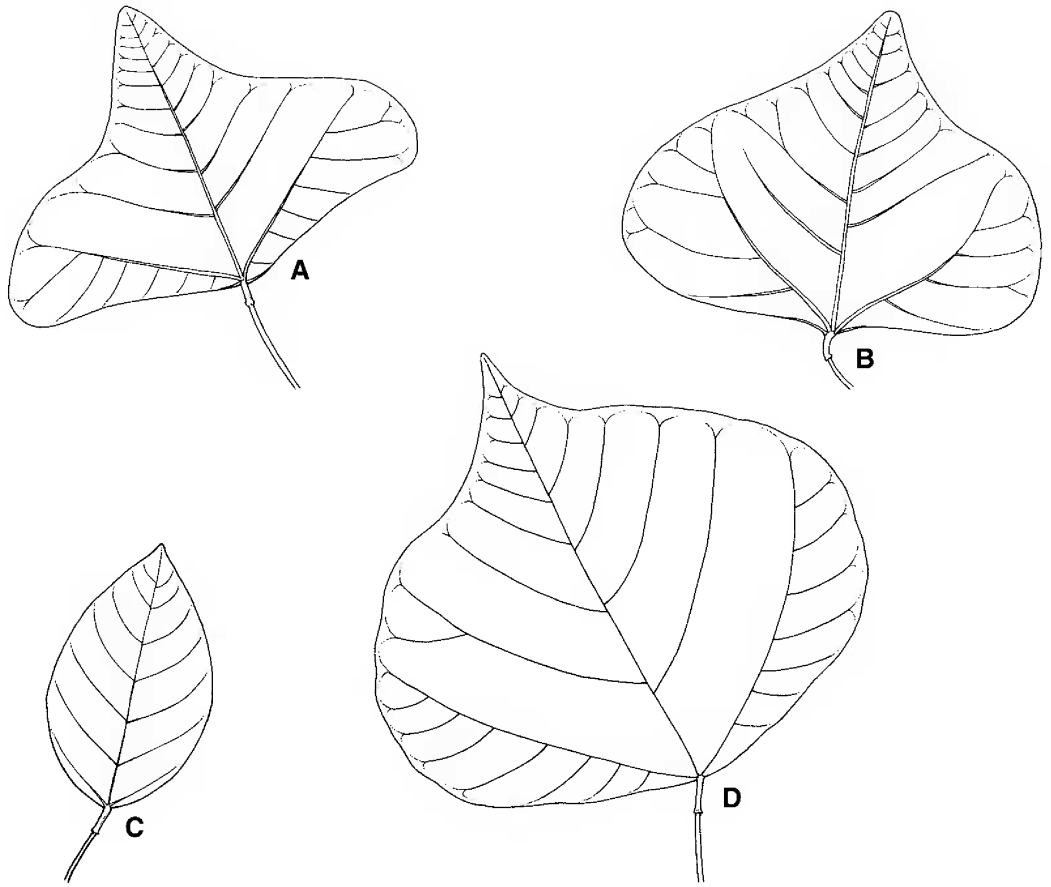

Fig. 2. Terminal leaflets of ***Erythrina*** spp. A. ***E. vespertilio*** subsp. ***vespertilio***. B. ***E. insularis***. C. ***E. fusca***. D. ***E.*** × ***sykesii***. A from *Hinz 533*; B from *Hucks 164*; C from *Morris s.n.* (AQ497997); D from *Batianoff 0302118*. All BRI. Del. B. Connell.

terminal branchlets. Fertile plants may be readily identified. The flowers of *E. insularis* are pale greenish-yellow on the day of opening, changing to orange-red when senescent, standard 25–41 mm long (*E. variegata* flowers orange-red at all stages, standard 52–68 mm long); the pods of *E. insularis* are smooth or faintly striate, moniliform and the seeds bright red (pods reticulately veined, not constricted, seeds brown or purplish-brown for *E. variegata*).

Bailey noted in the protologue that some trees were completely without prickles, and some recent collectors have noted the same. Card (2001) recorded that (for Milman Island) prickles or spines are absent from the stems of the species.

Card (2001) discovered that the seeds of *Erythrina insularis*, in contrast to *E. variegata* and *E. fusca*, do not float in seawater, but rather sink immediately to the bottom. However, she said that seeds could still be ocean dispersed when attached to pods or caught up in rafts of drift material. This dispersal difficulty perhaps explains why *E. insularis* has such a restricted distribution compared to *E. variegata* and *E. fusca*.

Etymology: From the Latin *insularis*, meaning an island, because of the island location of the first collection.

3. Erythrina vespertilio Benth. in T.L. Mitchell, *J. Exped. Trop. Australia* 218 (1848); *Corallodendron vespertilio* (Benth.) Kuntze, *Revis. Gen. Pl.* 1: 173 (1891). **Type:** Queensland. WARREGO DISTRICT. Subtropical New Holland [near Mt Faraday], 29 June 1846, *T.L. Mitchell 189* (lecto: K, *fide* Krukoff & Barneby (1974: 435)).

Tree 3–20 m high, deciduous. Bark corky, fissured or furrowed, creamy, grey, grey-brown or yellowish cream-grey. Trunk and branches bearing prickles, terminal branchlets with or without prickles. Indumentum comprising minute stellate or dendritic hairs, confined to apical section of branchlets, developing leaves, ovaries and young fruits. Leaves uniformly green, not waxy below. Leaflet venation penninerved, either not 3-veined at base or veins converging above base of leaflet. Inflorescences borne on leafless branches, 13–35-flowered, 11–33 cm long, rachis and peduncle about the same length, peduncle 1.5–4.2 mm diameter; fascicles 1–3-flowered, often two fascicles at same position along rachis, each fascicle group 8–15(–25) mm apart on rachis, pedicels 12–24 mm long at anthesis; calyx tubular in bud, 15–21 mm long, truncate or with minute lobes, a longitudinal lateral split developing as corolla expands, extending almost to base of calyx; all petals orange-red to scarlet, prominently veined; standard 32–40 × 16–20 mm, apex obtuse, strongly recurved and exposing staminal column; wing and keel petals about equal in size and shape; wings 8–16 × 3–5.5 mm long; keel petals 10–13 × 3–5.5 mm long, free, obtuse; stamens 35–45 mm long, anthers 2.1–2.8(–3.1) mm long, pale brown to brown; ovary densely stellate–hairy, ovules 6–8. Pods slightly curved when mature, 7–14 cm long, 1.1–1.5 cm wide at widest point, conspicuously narrowed between the seeds, glabrous at maturity, dehiscent and with seeds easily visible, outer surface smooth or with faint raised parallel veins. Seeds 1–4, rarely 5, ellipsoidal, uniform in colour, orange to scarlet, with a pale hilum. *Bat's wing coral tree*.

***Distribution*:** This species is endemic to Australia and comprises two subspecies.

***Typification*:** There are two sheets at K collected by T. Mitchell, both available to Bentham when drawing up the protologue. Krukoff & Barneby (1974) cited "*Mitchell 189* (1846) (K-holotype)", interpreted here as lectotypification of the name.

***Etymology*:** From the Latin *vespertilio*, a bat. This refers to the shape of the leaflets, which resemble the profile of a bat in flight.

The subspecies can be distinguished as follows:

Leaflets broadly V-shaped; central lobe absent or up to 12 mm long, lateral lobes parallel-sided, 32–66 mm long and 5–17 mm wide; seeds 11.5–16.5 mm long . . . . . subsp. **biloba**

Leaflets rhomboid to obdeltoid, central lobe well developed (8–40 mm long), lateral lobes tapering, 20–50 mm wide at their base; seeds 10–11.5 mm long . . . . . subsp. **vespertilio**

3a. Erythrina vespertilio Benth. subsp. **vespertilio**

Erythrina vespertilio var. *vespertilio*, Domin, Biblioth. Bot. 89: 221 (1926).

Erythrina vespertilio var. *typica* Domin, *Biblioth. Bot.* 89: 221 (1926), *nom. illeg.*

***Illustrations*:** Brock (1988: 149), as *E. variegata* var. *orientalis*; Williams (1979: 111); Cooper & Cooper (2004: 211).

Petioles unarmed, terete, 40–82 mm long; petiolule of basal leaflets 5–6 mm long; terminal leaflet 28–85 mm long, 33–112 mm wide, length/breadth ratio mostly 0.6–0.84, to 1.06 on Cape York peninsula; base cuneate; terminal lobe 8–40 mm long, apex acuminate, acute or obtuse; margins sinuate, forming obtuse, tapering, often prominent lateral lobes 14–38 mm long, 20–50 mm wide at their base. Seeds 10–11.5 mm long. **Figs 1A, 2A, 3.**

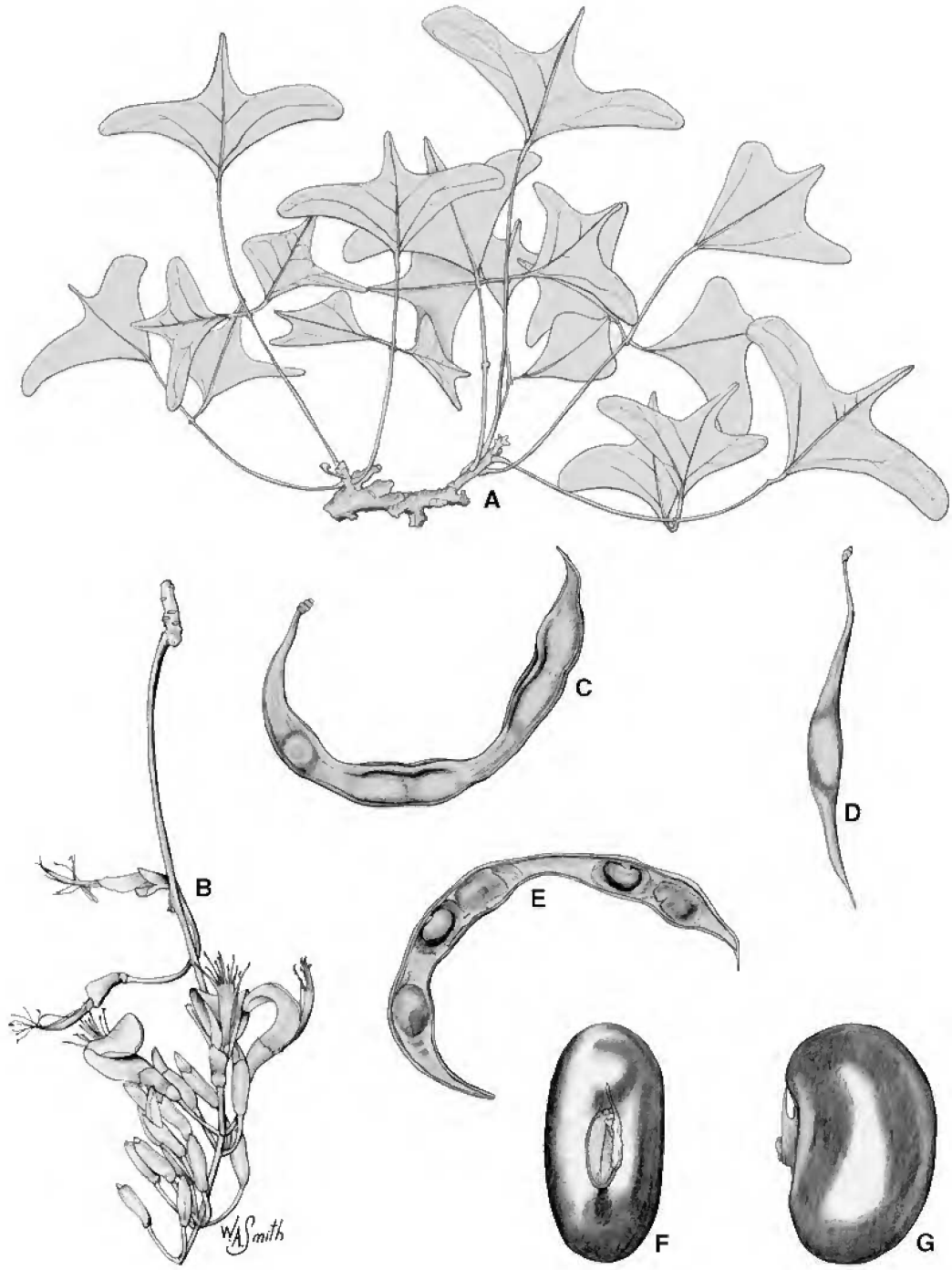

Fig. 3. ***Erythrina vespertilio*** **subsp.** ***vespertilio***. A. leafy branchlet × 0.5. B. single inflorescence bearing buds and flowers × 0.5. C, E. the two halves of an atypically long fruit containing seeds × 0.5. D. typical fruit × 0.5. F, G. seed × 3. A & B from *Forster PIF7686* (BRI); C–G from *Forster PIF7730* (BRI). Del. W. Smith.

***Additional selected specimens examined*: Western Australia.** near Poompangala Hill, 9 km NW of Kalumburu, May 1993, *Cowie 4277* (MEL); on road to Warrender, past Lone Dingo turn off, Mitchell Plateau, Sep 1978, *Clayton-Greene s.n.* (MEL2117860A); near Ord River, 1884, *Johnston s.n.* (MEL72472A); on ridge between Calder River and billabong, *c.* 5 km N of Walcott Inlet, Manja Camp, Aug 2001, *Shepherd 62* (MEL). **Northern Territory.** Groote Eylandt, Hemple Bay, May 1948, *Specht s.n.* (BRI [AQ230649]); Nabarlek, Jun 1989, *Hinz 533* (BRI); Oenpelli, Oct 1948, *Specht 1309* (BRI); about SW of Brock's Creek, Jul 1946, *Blake 16478* (BRI); Rockhole Creek, Nitmiluk, Jul 1990, *Evans 3285* (BRI); near mouth of Foelsche River, Jul 1948, *Perry 1831* (BRI); Guy Cave Area, 16 miles Cave Reserve, south of Katherine, May 1978, *Webb 13028* (BRI). **Queensland.** Cook District: Thursday Island, Jul 1975, *Stocker 1238* (BRI); Archer River, Wenlock – Coen road, Jul 1948, *Brass 19760* (BRI); Larrod's Hill, Sep 1976, *Hyland 8955* (BRI). Burke District: Karumba, Aug 1943, *Blake 15132* (BRI, MEL). North Kennedy District: Lansdown, *c.* 25 miles [40 km] S of Townsville, Mar 1971, *Robertson T203* (BRI); Mt Abbot, 50 km W of Bowen, Oct 1992, *Bean 5202* (BRI). South Kennedy District: 2 km SW of Dudgeon Point, Mackay, Feb 1993, *Batianoff 930252* (BRI); 1 km S of Cape River, on Gregory Developmental Road, Nov 1991, *Thompson 128* (BRI). Leichhardt District: *c.* 3.2 km S of Umolo turnoff, Nov 1973, *Williams 367* (BRI). Port Curtis District: Pine Mt, Marlborough, May 1998, *Batianoff 9805213* (BRI); Mt Castletower N.P., eastern slopes, Many Peaks Range, Feb 1995, *Forster PIF16319* (BRI). Burnett District: Bania S.F., north of Mt Perry, Mar 1995, *Bean 8492* (BRI, MEL); 6 km NNE of Coalstoun Lakes, Apr 1991, *Forster PIF7860* (BRI). Wide Bay District: Delley Road, N of Biggenden, Nov 2001, *Bean 18057* (BRI, MEL); 2 km NNE of Didcot, Nov 1997, *Forster PIF21858* (BRI). Moreton District: Redbank Plains, Ipswich, Jan 1992, *Bird s.n.* (BRI [AQ520215]).

***Distribution and habitat*:** This subspecies is widespread across northern and north-eastern Australia (Kimberley region of W.A., Top End of N.T. and the eastern half of Qld). In Qld it extends as far north as Thursday Island, and south to around Ipswich (**Map 8**).

***Phenology*:** For northern Australia (the Top End of N.T., Gulf of Carpentaria, far north Qld), flowering occurs from June to September; in central and southern Qld, flowering occurs from October to December; fruits may be found from November to April.

***Notes*:** While the leaflets of *Erythrina vespertilio* subsp. *vespertilio* are strongly 3-veined at the base, the veins almost always converge at a point inside the lamina surface, i.e. removed from the point of insertion of the petiole. This provides a very useful way to distinguish sterile specimens of *E. vespertilio* from most other Australian species.

3b. Erythrina vespertilio subsp. **biloba** (F.Muell.) A.R.Bean, **combinatio et status nova**

Basionym: *Erythrina biloba* F.Muell., *Hooker's J. Bot. Kew Gard. Misc.* 9: 21 (1857); *E. vespertilio* var. *biloba* (F.Muell.) Domin, *Biblioth. Bot.* 89: 221 (1926). **Type:** Northern Territory or Western Australia. at the foot of a little granite range at the head of Hooker's Creek and Sturt's Creek, January 1856, *F. Mueller s.n.* (holo: MEL 72396; iso: K).

***Illustration*:** Milson (2000: 82–83).

Petioles unarmed, terete, 48–110 mm long; petiolules 3–5 mm long; leaflets broadly Y-shaped, terminal leaflet 14–36 mm long, 33–144 mm wide, length/breadth ratio 0.19–0.32 (–0.51); base cuneate to attenuate; terminal lobe often absent, sometimes present, 0–12 mm long, apex acute or obtuse; lateral lobes 32–66 mm long, 5–17 mm wide, straight or somewhat recurved, length/breadth ratio 3.3–9.1, obtuse, parallel–sided. Seeds 11.5–16.5 mm long. **Fig. 1B**.

***Additional selected specimens examined*: Western Australia.** Nickol Bay, 1876, *Crouch s.n.* (MEL); Blackfellows Creek crossing on Winnama Yards track, 3 km S of Texas Downs road, Jul 1984, *Scarlett 84–387* (MEL); Fortescue River, 1878, *Forrest s.n.* (MEL). **Northern Territory.** 6 miles [10 km] N of Aileron Homestead, Mar 1955, *Winkworth 868* (BRI); Barrow Creek, 1880, *Chandler s.n.* (MEL); Yarraji, 63 km NE Bob Well, Lander River, Jul 1989, *Latz 11553* (MEL); Singleton, 240 miles [386 km] N of Alice Springs, Jan 1950, *Everist 4241* (BRI); 13 miles [21 km] NW of Napperby Homestead, May 1956, *Chippendale 2059* (BRI, NSW); *c.* 4 miles [c. 6 km] NNW of Mt Ziel, Jul 1968, *Beauglehole 27180* (MEL); N side of Mt Liebig, Jul 1988, *Corrick 10336* (MEL); Hatches Creek, Nov 1968, *Byrnes NB1132* (BRI); Redbank Gorge, Heavitree Range, Sep 1969, *Gittins 2038* (BRI, NSW). **South Australia.** north of Oodnadata, 1915, *Freeman s.n.* (NSW). **Queensland.** Burke District: Lake Moondara road, Mt Isa, Nov 1996, *Dean SB72* (BRI); 58 miles [93 km] SSE of Camooweal, May 1948, *Perry 729* (BRI). Mitchell District: Grey Range, about 3 km W of Mount Grey, on Blackall – Yaraka road, Nov 1990, *McRae s.n.* (BRI [AQ501724]); Parkgate, *c.* 55 km SE of Barcaldine, Jan 1995, *Smyrell GS105* (BRI). Gregory North District: Bladensburg N.P., S of Winton, Opalton road, Mar 1998, *Forster PIF22195 & Booth* (BRI, MEL); Raymore – Kyabra road, 60 km NNW of Eromanga, Jan

1998, *Pegler LKP152* (BRI). WARREGO DISTRICT: Idalia N.P., Emmet Pocket, Nov 1990, *Morgan CM35* (BRI); Adavale, Mar 1922, *Graw s.n.* (BRI [AQ230644]).

***Distribution and habitat*:** Widely distributed in central Australia, north of about 28° S latitude, including W.A., N.T., Qld and the far north of S.A. (**Map 7**). It is not known from N.S.W. It grows on a wide range of soil types, often in locations that receive extra water e.g. base of rocky hills, creek banks etc.

***Phenology*:** Flowers are recorded from October to March; fruits from January to May.

***Notes*:** This subspecies differs from subspecies *vespertilio* mainly in leaf shape. The difference is however, so marked, and so well correlated to geographical distribution, that a rank of subspecies is considered to be appropriate. The two subspecies do show some intergradation in leaf form, as evidenced by three specimens at BRI (*Hyland 6149*, *Morgan CM35*, and *Clemens s.n.* [AQ199198]), but the great majority of collections may be readily assigned to one or the other. The seed size also appears to be diagnostic, as for each of the eight seed-bearing specimens at BRI and MEL, the seed length of *Erythrina vespertilio* subsp. *biloba* exceeds that for *E. vespertilio* subsp. *vespertilio*.

***Etymology*:** from the Latin *bi* meaning two and *lobus* meaning lobes. This is a reference to the distinctive leaflet morphology.

4. Erythrina numerosa A.R.Bean **species nova** Species nova affinis *E. vespertilio* sed leguminibus longioribus semina 5–11 continentibus, ovulorum numeris majoribus, caudice laevi unsulcato, floribus in inflorescentia magis dense aggregata, antheris longioribus et corolla pallidiore (aurantiaca usque vitellina) differt. **Typus:** Queensland. MORETON DISTRICT: Splityard Creek, Wivenhoe Dam, 10 February 1991, *L.H. Bird & P.R.Sharpe s.n.* (holo: BRI [AQ547555]; iso: A, CANB, K, MEL, NSW, US, distribuendi).

Erythrina sp. (Croftby P.I.Forster+ PIF6209) in Bostock & Holland (2007).

***Illustrations*:** Nicholson & Nicholson (1991: 26), as *E. vespertilio*; Williams (1979: 110), as *Erythrina* sp.

Tree 5–20 m high, deciduous. Bark smooth, not furrowed, somewhat shiny, creamy, grey, brownish or greenish, with conical corky outgrowths surmounted by prickles. Trunk, branches and terminal branchlets all bearing prickles. Indumentum comprising minute stellate hairs, confined to apical section of branchlets, developing leaves, ovaries and young fruits. Leaves uniformly green, not waxy below. Petioles unarmed, terete, 45–120 mm long; petiolule of basal leaflets 3.5–7 mm long; terminal leaflet 60–95 mm long, 78–113 mm wide, length/breadth ratio 0.63–1.09, apex obtuse; base obtuse to cuneate; margins sinuate, forming obtuse, tapering, often prominent lateral lobes. Leaflet venation penninerved, either not 3-veined at base or veins converging above base of leaflet. Inflorescences borne on leafless branches, 15–60-flowered, 14–46 cm long, rachis shorter than peduncle, peduncles 3.5–9 mm diameter; fascicles 3-flowered, often two or three fascicles at same position along rachis, each fascicle group 1.5–8 mm apart on rachis, pedicels 9–17 mm long at anthesis; calyx tubular in bud, 17–25 mm long, truncate or with minute lobes, a longitudinal lateral split developing as corolla expands, extending almost to base of calyx; all petals salmon-coloured to orange, prominently veined; standard 39–54 × 21–28 mm, apex obtuse, strongly recurved and exposing staminal column, wings slightly longer than keel, wings 15–18 mm long; keel petals 13–16 mm long, free, obtuse; stamens 35–48 mm long, anthers 2.8–4.3 mm long, yellow to brown; ovary densely stellate hairy, ovules 12–16. Pods strongly curved at maturity, 13–24 cm long, 1.1–1.6 cm wide at widest point, conspicuously narrowed between the seeds, dehiscent when mature with seeds easily visible, glabrous at maturity, surface smooth or striate. Seeds 5–11, ellipsoidal, 9–13 mm long, uniform in colour, orange to red, with a pale hilum. *Pine Mountain coral tree*, *Pine Mountain corkwood*. **Figs 1E, 3**.

***Additional selected specimens examined*: Queensland.** BURNETT DISTRICT: Meandu Mine, Tarong Coal, Feb 1994, *Forster PIF14838 & Smyrell* (BRI). WIDE BAY DISTRICT: Oakview S.F. 220, 2.8 km SSE past barracks, Jul 1990, *Forster PIF6939* (BRI, MEL); 14.1 km from Kenilworth, along Booloumba Creek road, Nov 1990,

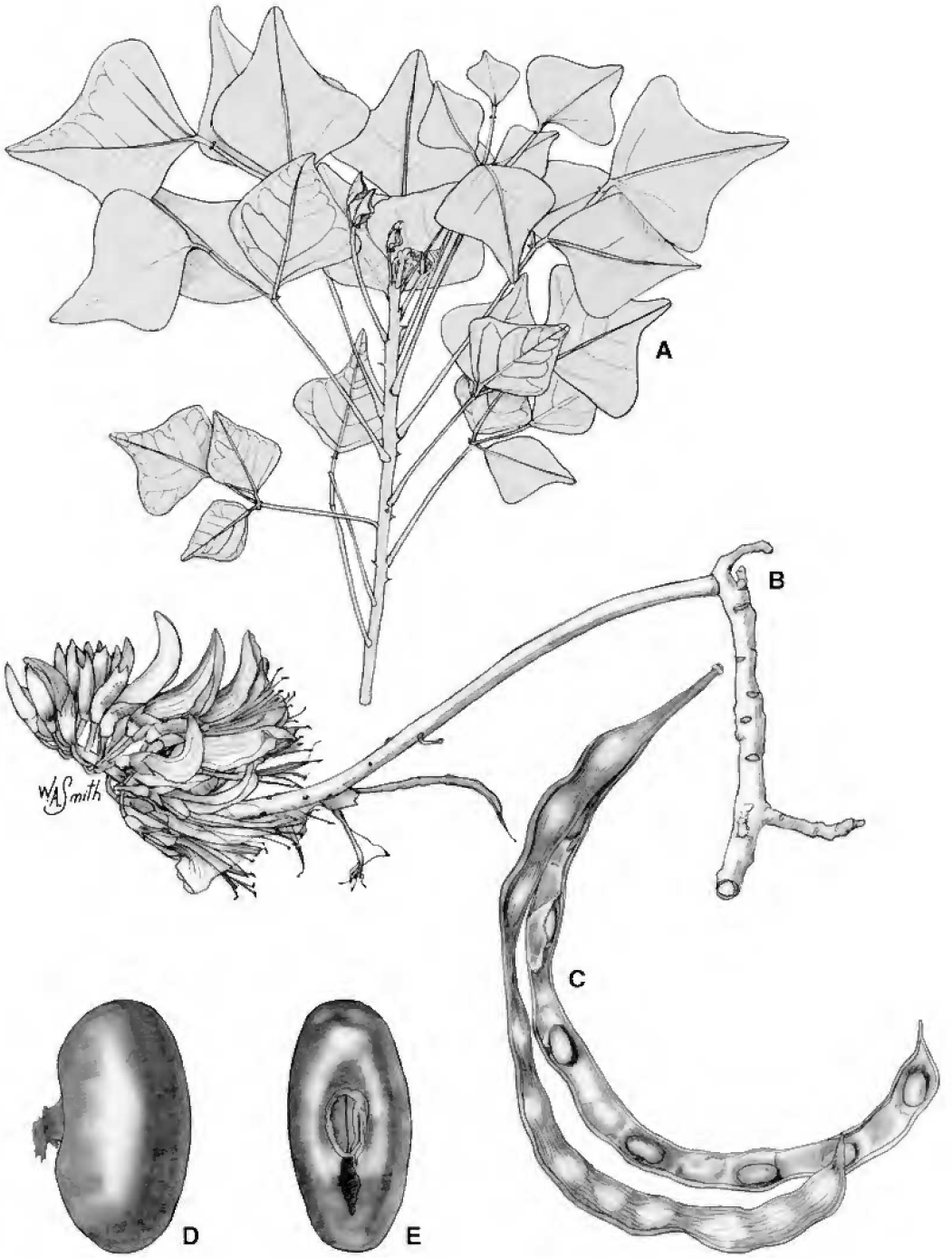

Fig. 4. ***Erythrina numerosa***. A. leafy branchlet × 0.4. B. single inflorescence bearing buds and flowers × 0.4. C. mature fruit containing seeds × 0.5. D, E. seed × 3. A, B from *Forster PIF7618* (BRI); C–E from *Forster PIF7777* (BRI). Del. W. Smith.

Bean 2647 (BRI); Wide Bay, Aug 1843, *Leichhardt s.n.* (MEL). Darling Downs District: 2 miles [3 km] S of Maclagan, Nov 1970, *Rawlings s.n.* (BRI [AQ199200]). Moreton District: Commissioners View, *c.* 10km E of Blackbutt, Oct 2001, *Bean 17998* (BRI); World's End Pocket at end of Pine Mountain Road, N of Ipswich, Nov 1981, *Bird s.n.* (BRI [AQ347049]); World's End Pocket, Pine Mountain, Nov 1978, *Williams 78249* (BRI); Petrie, 18 miles [29 km] N of Brisbane, Dec 1931, *Blake 3071* (BRI); S.F. 1355 Kipper Creek, Nov 1994, *Forster PIF15888* (BRI); Splityard Creek, Wivenhoe Dam, Nov 1990, *Forster PIF7618 et al.* (BRI); Mt Crosby cliffs, Brisbane River, Feb 1991, *Bird & Collins s.n.* (BRI [AQ547556]); Barnes Hill Pipeline Reserve, Mt Crosby road, Mt Crosby, Oct 1993, *Grimshaw G8 et al.* (BRI); Moggill Scrub, undated, *Stuart 238* (MEL); Brisbane River, Jul 1855, *Mueller s.n.* (MEL); *c.* 2 km NE of Perrys Knob, Mt Marrow area, 4.2 km SSE of Marburg, Oct 1999, *Pollock ABP708 & Leach* (BRI); Neumann's Lookout, 2 km W of Mount Berryman, Feb 1991, *Forster PIF7777* (BRI, MEL); Pimpama, Mar 1889, *Simmonds 115* (BRI); property of A. Schumacher, Milford, SE of Boonah on Rathdowney road, Nov 1981, *Bird s.n.* (BRI [AQ347246]); Boonah – Croftby road, 4.8 km S of Carney's Creek crossing, Oct 2000, *Bean 16908* (BRI). **New South Wales.** North Coast: Acacia Creek, via Killarney, Dec 1905, *Dunn s.n.* (NSW); Mt Warning, Jan 1936, *Fraser s.n.* (NSW); Tyalgum Ridge, Limpinwood Nature Reserve, *c.* 25 km WNW of Murwillumbah, Dec 1977, *Coveny 9932 & Haegi* (BRI, NSW); Bog Onion road, Mebbin S.F., *c.* 7 miles [c. 11 km] S of Tyalgum, Nov 1966, *Hayes 2590 et al.* (NSW); Mt Mullengen, 4 miles [6 km] E of Ramornie, Jul 1922, *Blakely & Shiress s.n.* (NSW).

***Distribution and habitat*:** *Erythrina numerosa* is distributed from Nymboida in New South Wales (Harden *et al.* 2006) to Kilkivan in Queensland (**Map 5**). It grows in araucarian notophyll vine forest or on its margins.

***Phenology*:** Flowers are recorded from October to December; fruits from February to June.

***Notes*:** *Erythrina numerosa* differs from *E. vespertilio* by the peduncles 3.5–8.5 mm diameter (*vs.* 1.5–4.2 for *E. vespertilio*), fascicles 1.5–8 mm apart (*vs.* 8–15), standard petal 39–54 mm long (*vs.* 32–40 mm), keel petals 13.5–15.5 mm long (*vs.* 10–13), anthers 2.8–4.3 mm long (*vs.* 2.1–2.8(–3.1) mm), ovary with 12–16 ovules (*vs.* 6–8), pods 13–24 cm long and containing 5–11 seeds (*vs.* 7–14 cm long and containing 1–4(–5) seeds). In the field, it is conspicuously different by virtue of the smooth, unfurrowed trunk, sometimes rather shiny; in contrast *E. vespertilio* has a dull corky, ridged trunk. The orange to salmon-coloured corolla of *E. numerosa* is markedly paler than that of *E. vespertilio*, in which the corolla is varies from scarlet to orange-red.

***Etymology*:** The epithet refers to the numerous seeds in each pod, in comparison with *Erythrina vespertilio* and other Australian species.

5. *Erythrina caffra Thunb., *Fl. Cap.* Ed. 2, 559 (1823); *Duchassaingia caffra* (Thunb.) Walp., *Linnaea* 23: 741 (1850); *Corallodendron caffrum* (Thunb.) Kuntze, *Revis. Gen. Pl.* 1: 172 (1891). **Type:** South Africa. "e. cap. b. spei Thunberg", *C.P. Thunberg s.n.* (holo: UPS-Thunb. 16302 [microfiche!]).

Tree 6–10 m high, briefly deciduous. Bark mostly smooth, with shallow longitudinal furrows, grey to grey–brown. Trunk and branches bearing large scattered conical prickles, terminal branchlets with prickles. Indumentum comprising minute simple hairs, confined to apical section of branchlets, developing leaves, ovaries and young fruits. Leaves uniformly green, not waxy below. Petioles unarmed, terete, 50–100 mm long; petiolule of basal leaflets 4–7 mm long; terminal leaflet deltoid, rhomboid or broadly trullate, 55–105 mm long, 50–100 mm wide, length/breadth ratio 1.04–1.31, apex acute to acuminate; base obtuse or truncate; lateral lobes absent; basal leaflets similar but smaller than the terminal one. Leaflet venation penninerved, basal pair of lateral veins converging at point of petiole attachment. Inflorescences borne on leafless branches, 50–100-flowered, 10–18 cm long, rachis usually shorter than peduncle, peduncles 4–5 mm diameter; fascicles 3-flowered, often two or three fascicles at same position along rachis, each fascicle group 3–7 mm apart on rachis, pedicels 5–8 mm long at anthesis; calyx tubular in bud, 9–12 mm long, truncate or with minute lobes, splitting apically as corolla expands, at anthesis shortly bilabiate; all petals orange to scarlet, prominently veined; standard 35–55 × 14–28 mm, apex obtuse, strongly recurved and exposing staminal column, wings and keel similar, wings 13–24 mm long; keel petals 12–21 mm long, fused, obtuse; stamens

38–50 mm long, anthers 2.3–4.3 mm long, yellow to brown; ovary hairy, ovules 8–10. Pods not strongly curved when mature, 6–10 cm long, 0.9–1.2 cm wide at widest point, conspicuously narrowed between the seeds, outer surface smooth, dehiscent, seeds easily visible, glabrous at maturity. Seeds 2–4, ellipsoidal, 6–8 mm long, uniform in colour, red, with a dark hilum. *Kaffir coral tree*. **Fig. 1C**.

***Additional specimens examined*: Queensland.** MORETON DISTRICT: SW side of Mt Coot-tha, at Chapel Hill Environmental Education Hut, off Fleming road, Sep 1998, *Stephens GBS12* (BRI); Forestry Road, just past lookout, Mt Coot-tha, Sep 1999, *Boyle TPB50 & Lahey* (BRI).

***Distribution and habitat*:** *Erythrina caffra* is sparingly naturalised around Brisbane (**Map 1**), where it has been found on hillsides in woodland dominated by *Eucalyptus* spp. It is also recorded as naturalised on Norfolk Island (Green 1994).

***Phenology*:** Flowers recorded for May and September; fruits in November.

***Notes*:** *Erythrina caffra* originated in South Africa, in coastal forests of the Eastern Cape and KwaZulu-Natal (Hennessey 1991). It has been cultivated in Brisbane since at least 1933 (*White 9026*, BRI).

***Etymology*:** The species name *caffra* refers to Kaffraria, an old name for a part of the Eastern Cape region of Africa.

6. *Erythrina × sykesii Barneby & Krukoff, *Lloydia* 37: 447 (1974). **Type:** Queensland. cultivated at Brisbane Botanic Gardens, 12 June 1933, *C.T.White 9073* (holo: NY; iso: BRI).

Tree 2.5–10 m high, deciduous. Bark mostly smooth, with pale longitudinal fissures, grey to brown. Trunk and branches with prickles, terminal branchlets with or without prickles. Indumentum comprising minute simple hairs, confined to apical section of branchlets, developing leaves and ovaries. Leaves uniformly green, not waxy below. Petioles unarmed, terete, 80–170 mm long; petiolule of basal leaflets 6–10 mm long; terminal leaflet deltoid to rhomboid, 95–180 mm long, 80–230 mm wide, length/breadth ratio 0.78–1.16, apex acuminate or acute; base obtuse to broadly cuneate. Leaflet venation penninerved, basal pair of lateral veins converging at point of petiole attachment (i.e. 3-veined at base). Inflorescences borne on leafless branches, 30–100-flowered, 17–30 cm long, rachis and peduncles about same length, peduncles 4–6 mm diameter; fascicles 3-flowered, often two or three fascicles at same position along rachis, each fascicle group 1–8 mm apart on rachis, pedicels 4–6 mm long at anthesis; calyx tubular in bud, 9–12 mm long, 2-lipped and 14–18 mm long at anthesis; petals red, prominently veined; standard 48–64 × 18–24 mm, apex acute, slightly recurved, staminal column exposed, wings and keel similar, wings 20–28 mm long; keel petals 18–27 mm long, fused to each other for most of their length, obtuse; stamens 55–60 mm long, anthers 2.8–4.5 mm long, yellow; ovary hairy, ovules 11–13. Fruits do not develop. *Thorny coral tree*. **Fig. 2D**.

***Additional specimens examined:* Queensland.** COOK DISTRICT: Bromfield Crater, Atherton Tableland, Jul 1966, *Brass 33486* (BRI); Egan Creek L.A., SW corner, T.R. 756, Parish of Jordan, Nov 1958, *Smith 10478* (BRI). NORTH KENNEDY DISTRICT: Herberton, north Queensland Tablelands, Feb 2003, *Batianoff 0302118 & Batianoff* (BRI); North Cedar Creek, Ravenshoe, Feb 2003, *Batianoff 0302119 & Batianoff* (BRI). MORETON DISTRICT: Nambour, Apr 1970, *O'Mara 104* (BRI); Golden Beach Caloundra, Sunshine Coast, Aug 1998, *Batianoff 98083 & Batianoff* (BRI); North Stradbroke Island, Amity Point, Kindaria Street, Aug 2003, *Batianoff 030899 & Boyle* (BRI); Curtis road, Mt Tamborine, Sep 2000, *Bean 16823* (BRI). **New South Wales.** NORTH COAST: Fingal Head, Jul 1998, *Batianoff 980712* (BRI, MEL); Byron Bay, Cape Byron main beach, Jul 1998, *Batianoff 980721* (BRI); Richmond River, Casino, Jul 2004, *Bean 22676* (BRI); Valla, 20 km N of Nambucca Heads and 50 km S of Coffs Harbour, Dec 2004, *Hall s.n.* (BRI [AQ612871]); Woolooware Bay, Cronulla, on Kurnell road, Jul 1976, *Coveny 7753 & Hind* (NSW); ruins of Ellamatta Homestead, Reddells road, *c.* 5 km W of Kembla Grange, Jul 1996, *Jobson 4316* (NSW).

***Distribution and habitat*:** *Erythrina × sykesii* is naturalised in New Zealand (Webb *et al.* 1988) and Australia. In Australia, naturalisations are known from some coastal parts of Qld and N.S.W. (including Lord Howe Island), and around Perth (Paczkowska & Chapman 2000) in W.A. (**Map 9**). It inhabits cleared or disturbed places where the soil is frequently moist, particularly near creeks.

***Phenology*:** Flowers are recorded from July to November.

***Notes*:** The parentage of *Erythrina* × *sykesii* is unknown. Krukoff & Barneby (1974) suggested that the parents could be *E. coralloides* DC. and *E. lysistemon* Hutch. This suggestion was repeated by Spencer (2002). Hennessy (1991) gave *E. speciosa* Andr. and *E. caffra* as the probable parents, and cited morphological features allying it to those species. The origin of *E.* × *sykesii* is also unknown but it has been cultivated for several decades in both Australia and New Zealand (Spencer 2002). It does not produce fruits, but vegetative pieces, even sections of trunk, will sprout roots readily (Esler & Edgar 1997; pers. obs.).

***Etymology*:** Named for W.R. (Bill) Sykes, a New Zealand botanist.

7. *Erythrina crista-galli L., *Mant. Pl.* 99 (1767); *Micropteryx crista-galli* (L.) Walp., *Linnaea* 23: 740 (1840); *Corallodendron crista-galli* (L.) Kuntze, *Revis. Gen. Pl.* 172 (1891). **Type:** Brazil, undated, *D. Vandelli s.n.* (lecto: LINN, Cat. no. 888.4 *fide* Howard (1988)).

***Illustration*:** Whistler & Elevitch (2006: 332).

Evergreen tree 4–8 m high, trunk and branches without prickles, terminal branchlets without prickles. Bark corky, deeply furrowed, grey to brown. Indumentum comprising minute simple hairs, confined to apical section of branchlets, developing leaves, ovaries and young fruits. Leaves uniformly green, minutely reticulately waxy below. Petioles frequently bearing 1 or 2 recurved prickles, terete, 60–140 mm long; petiolule of basal leaflets 8–13 mm long; terminal leaflet 58–130 mm long, 25–77 mm wide, length/breadth ratio 1.7–2.3, apex acute, base cuneate, lateral lobes absent; basal leaflets identical to, or slightly smaller than the terminal one. Leaflet venation penninerved, without a basal pair of lateral veins. Inflorescences in leaf axils or at end of leafy branchlets, 12–80-flowered, 10–40 cm long, rachis and peduncle not distinguishable; fascicles 2–3- flowered, one or sometimes two fascicles at any position along branchlet, each fascicle (group) 2–32 mm apart on branchlet, pedicels 13–25 mm long at anthesis; calyx broadly campanulate in bud, 9–13 mm long, truncate with two small deciduous teeth, not splitting longitudinally as corolla expands; petals prominently veined; standard pink, red or crimson on inner surface, pink on outer surface, broadly-elliptic, 40–55 × 34–46 mm, apex obtuse or emarginate, strongly recurved and exposing staminal column, wings and keel very dissimilar, wings white, 9–19 mm long, wholly or largely obscured by calyx, obtuse; keel petals pink, red or crimson, 30–45 mm long, fused, incurved, enclosing much of staminal column, acute; stamens 33–55 mm long; anthers 1.9–2.7 mm long, yellow; ovary hairy, ovules 16–21. Pods glabrous at maturity, 14–27 cm long, 1.3–1.6 cm wide at widest point, somewhat narrowed between the seeds, outer surface smooth, pods dehiscent and slightly curved when mature with seeds easily visible. Seeds 2–6, ellipsoidal, 12–16 mm long, not uniform in colour, black with brown streaks, with a pale hilum. *Cockspur coral tree, Cock's comb coral tree.* **Fig. 1D**.

***Additional specimens examined*: Queensland.** Wide Bay District: Tozer Gully, Cootharaba road, Gympie, Nov 2000, *Bean 17044* (BRI). Moreton District: intersection of Rode and Webster roads, Stafford Heights, Nov 1999, *Wrench s.n.* (BRI [AQ665547]); Cannon Hill College, Cannon Hill, 7 km E of Brisbane GPO, Oct 2000, *Bean 16979* (BRI, NSW); Brisbane River, Moggill Ferry Reserve, Sep 2000, *Batianoff 200816* (BRI); Paradise Road, Willawong, *c.* 15 km S of Brisbane CBD, May 2002, *Bean 19028* (BRI); tributary of Blunder Creek, Richlands, Brisbane, Oct 1997, *Hall & Bird s.n.* (BRI [AQ659717]); Greenbank, Brisbane, Nov 1991, *Robins s.n.* (BRI [AQ628572]). **New South Wales.** North Coast: 5 km SW of Lismore, Mar 1984, *Swarbrick 7404* (BRI); Wilson's River floodplain, beside Bruxner Highway, *c.* 3 km SW of Lismore, Oct 1990, *Smith JMBS935* (NSW); Casino, Jan 1991, *Clarke s.n.* (NSW).

***Distribution and habitat*:** *Erythrina crista-galli* is native to Argentina, Brazil, Bolivia, Paraguay and Uruguay (Krukoff & Barneby 1974). It has been widely cultivated in tropical and sub-tropical parts of the world, including South Africa, California (U.S.A.) and Australia. In Australia it has become naturalised in coastal Qld and N.S.W. (**Map 2**) (listed as a noxious weed in the latter state), where it inhabits sunny swampy areas, including areas where the groundwater is brackish.

***Phenology*:** Flowers have been recorded for nearly every month of the year; fruits (rarely collected) recorded in May, November and December.

***Notes*:** This species has been cultivated in Australia since at least 1924 (*White 2400*, BRI). It is the national flower of Argentina (Krukoff & Barneby 1974).

***Etymology*:** The epithet is derived from the Latin, and means 'cock's comb', almost certainly in reference to the linear fan-shaped arrangement of the stamens.

8. Erythrina fusca Lour., *Fl. Cochinch.* 427 (1790); *Corallodendron fuscum* (Lour.) Kuntze, *Revis. Gen. Pl.* 1: 173 (1891). **Types:** Cochinchina, *Louriero s.n.* (syn: not found); illustration of '*Gelala aquatica*' in Rumphius, *Herb. Amboin.*, 2: 235, t. 78 (syn: the illustration).

Evergreen tree to 23 m high. Bark ± smooth, though cracked and with large pustular lenticels, olive-brown. Trunk and branches with or without prickles, terminal branchlets with prickles. Indumentum comprising minute simple hairs, confined to apical section of branchlets, developing leaves, ovaries and young fruits. Leaves uniformly green, not waxy below. Petioles unarmed, terete, 50–100 mm long; petiolule of basal leaflets 7–10 mm long; terminal leaflet 70–120 mm long, 43–76 mm wide, length/breadth ratio 1.58–1.81, apex acute; base obtuse to cuneate; lateral lobes absent; basal leaflets similar but smaller than the terminal one. Leaflet venation penninerved, basal pair of lateral veins converging at point of petiole attachment. Inflorescences borne on leafless branches, 18–30-flowered, 10–26 cm long, rachis and peduncles about same length, peduncles 2.5–4.5 mm diameter; fascicles 3-flowered, each fascicle group 6–25 mm apart on rachis, pedicels 5–13 mm long at anthesis; calyx tubular in bud, 13–16 mm long, truncate or apiculate, a longitudinal split developing as corolla expands, campanulate and asymmetrical at anthesis; all petals prominently veined; standard 38–52 × 25–30 mm, yellow to orange, apex obtuse, strongly recurved and exposing staminal column; wings and keel similar; wings 18–22 mm long, creamy-white proximally, maroon distally; keel petals 20–27 mm long, creamy–white, fused, obtuse; stamens 33–40 mm long, anthers 2.2–3.7 mm long, yellow; ovary hairy, ovule number unknown. Pods glabrous at maturity, 11–20 cm long, 1.2–1.5 cm wide at widest point, slightly narrowed between the seeds, outer surface smooth, pods dehiscent and straight to slightly curved when mature. Seeds 6–12, ellipsoidal, 12–18 mm long, uniform in colour, dark brown. *Coral tree.* **Fig. 2C**.

***Additional specimens examined*: Queensland.** Cook District: Daintree Mission, Sep 1948, *Smith 4036* (BRI); Daintree River, below the township of Daintree, Oct 2000, *Morris s.n.* (BRI [AQ497997]).

***Distribution and habitat*:** *Erythrina fusca* is regarded as the most widespread species of the genus, indigenous to coastal areas of the tropics where annual rainfall is high, including eastern Africa, India, Malesia, many Pacific islands and western South America. In Australia, this species is apparently confined to the Daintree area of north Qld (**Map 3**), where the annual rainfall exceeds 2500 mm and the dominant vegetation type is lowland rainforest.

***Phenology*:** Flowers recorded in September; fruits in October.

***Notes*:** *Erythrina fusca* has not previously been reported as occurring in Australia, despite Smith's collection from the Daintree area in 1948. Apparently it was previously considered that the collection was made from a cultivated specimen. The second collection (cited above) has confirmed the non-cultivated status of *E. fusca* in Australia. However its origin status in Australia (indigenous or alien) remains unclear. Only one tree is currently known to local naturalists.

Drift seeds of *Erythrina fusca* (but not plants) have been recorded from islands of the Capricorn – Bunker group off the coast of Gladstone. These are thought to originate from islands of the Pacific (Smith 1992).

***Etymology*:** From the Latin *fuscus* meaning 'dark, dusky'. This perhaps alludes to the very dark-coloured seeds of this species.

Excluded names

Erythrina acanthocarpa E.Mey.

This species was recorded as perhaps naturalised in South Australia (Jessop & Toelken 1986), but according to R. Barker (pers. comm. 2007), a recent re-examination of the relevant specimen revealed some follow-up documentation to indicate that it was not established.

Erythrina lysistemon Hutch.

Krukoff (1972) identified the leaves of the type collection of *E. phlebocarpa* as belonging to *E. lysistemon*. This is refuted here (see discussion under *E. variegata*). As this was the only non-cultivated record of *E. lysistemon* for Australia, it is excluded from this account.

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I am grateful to Paul Forster and Ailsa Holland for advice and documentation regarding *Erythrina numerosa,* and Peter Bostock for the Latin diagnosis and distribution maps. Ellen Terrell and Dan Irby sent information about the occurrence of *E. fusca* at Daintree. Will Smith and Brian Connell provided the illustrations.

References

Adema, F. (1996). Notes on Malesian Fabaceae (Leguminosae-*Papilionoideae*), 1. The genus *Erythrina* L. *Blumea* 41: 463–468.

Bentham, G. (1864). *Erythrina*. In *Flora Australiensis* 2: 252–254. L. Reeve & Co.: London.

Bostock, P.D. & Holland, A.E. (eds.) (2007). *Census of the Queensland Flora 2007.* Queensland Herbarium, Environmental Protection Agency: Brisbane.

Britton, N.L. (1924). *Scientific Survey of Porto Rico & the Virgin Islands*, Volume 5. New York Academy of Sciences: New York.

Brock, J. (1988). *Top End Native Plants*. J. Brock: Darwin.

Card, M.A. (2001). *Vegetation dynamics of Milman Island, northern Great Barrier Reef, Australia.* PhD thesis, James Cook University: Townsville.

Cooper, W. & Cooper, W.T. (2004). *Fruits of the Australian Tropical Rainforest*. Nokomis Editions Pty Ltd: Melbourne.

Du Puy, D.J. & Telford, I.R.H. (1993). Fabaceae. In H.J. Hewson & H.S. Thompson (eds.), *Flora of Australia, Oceanic islands 2*, 50: 204–36. Australian Government Publishing Service: Canberra.

Esler, A. & Edgar, E. (1997). *Erythrina* × *sykesii*. *Auckland Botanical Society Journal* 52: 39–42.

Green, P.S. (1994). Fabaceae. In A.G.S. Wilson (ed.), *Flora of Australia, Oceanic Islands 1*, 49: 172–197. Australian Government Publishing Service: Canberra.

Harden, G.J., Mcdonald, W.J.F. & Williams, J.B. (2006). *Rainforest Trees and Shrubs - A field guide to their identification.* Gwen Harden Publishing: Nambucca Heads, New South Wales.

Hennessy, E.F.F. (1991). *Erythrineae* in southern Africa. *Bothalia* 21: 1–25.

Hickey, M. & King, C. (2000). *The Cambridge illustrated glossary of Botanical terms.* Cambridge University Press: Cambridge.

Howard, R.A. (1988). *Flora of the Lesser Antilles, Leeward and Windward Islands,* Volume 4. Arnold Arboretum: Cambridge.

Jessop, J.P. & Toelken, H.R. (1986). *Flora of South Australia Part II Leguminosae-Rubiaceae*. South Australian Government Printing Division: Adelaide.

Krukoff, B.A. (1972). Notes on Asiatic-Polynesian-Australian species of *Erythrina*, II. *Journal of the Arnold Arboretum* 53: 128–139.

—— (1982). Notes on the species of *Erythrina*. XVIII. *Allertonia* 3: 121–138.

Krukoff, B.A. & Barneby, R.C. (1974). Conspectus of species of the genus *Erythrina*. *Lloydia* 37: 332–459.

Merrill, E.D. (1917). *An Interpretation of Rumphius's Herbarium Amboinense*. Manila Bureau of Printing: Manila.

Milson, J. (2000). *Trees and shrubs of north-west Queensland*. Queensland Department of Primary Industries: Brisbane.

Nicholson, N. & Nicholson, H. (1991). *Australian Rainforest Plants III.* Terania Rainforest Nursery: The Channon, New South Wales.

Paczkowska, G. & Chapman, A.R. (2000). *The Western Australian Flora, a descriptive catalogue*. The Wildflower Society of Western Australia (Inc.), the Western Australian Herbarium, CALM and the Botanic Gardens and Parks Authority: Perth.

Smith, J.M.B. (1992). Patterns of disseminule dispersal by drift in the southern Coral Sea. *New Zealand Journal of Botany* 30: 57–67.

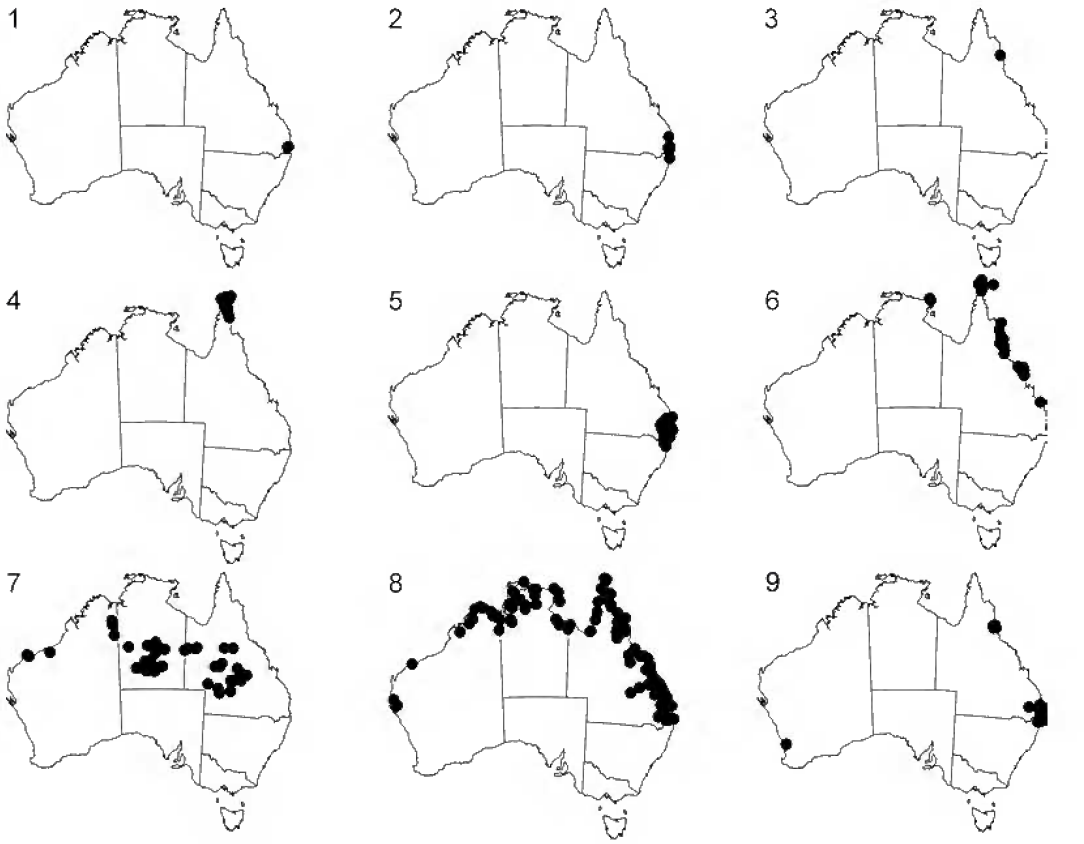
SPENCER, R. (2002). *Erythrina* L. In R.D. Spencer (ed.), *Horticultural Flora of South-eastern Australia* 3: 198–201. University of New South Wales Press: Sydney.

VERDCOURT, B. (1979). *A Manual of New Guinea Legumes.* Office of Forests, Division of Botany: Lae.

WEBB, C.J., SYKES, W.R. & GARNOCK-JONES, P.J. (1988). *Flora of New Zealand*, Volume 4, *Naturalised pteridophytes, gymnosperms, dicotyledons.* Botany Division DSIR: Christchurch.

WHISTLER, W. & ELEVITCH, C.R. (2006). *Erythrina variegata* (coral tree). In C.R. Elevitch (ed.), *Traditional trees of Pacific Islands: their culture, environment and use,* pp. 329–343. Permanent Agriculture Resources: Hawaii.

WILLIAMS, K.A.W. (1979). *Native Plants of Queensland.* Volume 1. K.A.W. Williams: North Ipswich, Australia.



Distribution of *Erythrina* spp. **Maps 1–9**.
Map 1. *E. caffra*. **Map 2**. *E. crista-galli*. **Map 3**. *E. fusca*. **Map 4**. *E. insularis*. **Map 5**. *E. numerosa*. **Map 6**. *E. variegata*. **Map 7**. *E. vespertilio* subsp. *biloba*. **Map 8**. *E. vespertilio* subsp. *vespertilio*. **Map 9**. *E.* × *sykesii*.